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Permalink
https://escholarship.org/uc/item/7710138h

Journal
Journal of Adolescent Health, 52(1)

ISSN
1054-139X

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Publication Date
2013

DOI
10.1016/j.jadohealth.2012.04.017

Peer reviewed

Receipt of Preventive Health Services in Young Adults

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Abstract

Objective—To examine self-reported rates and disparities in delivery of preventive services to young adults.

Design—Population-based cross-sectional analysis. Multivariate logistic regression was used to examine how age, gender, race/ethnicity, income, insurance, and usual source of care influence the receipt of preventive services.

Setting—2005 and 2007 California Health Interview Surveys (CHIS).

Participants—3670 and 3621 young adults aged 18-26 years who responded to CHIS 2005 and 2007, respectively.

Main Outcome Measures—Self-reported receipt of flu vaccination, STD screening, cholesterol screening, diet counseling, exercise counseling and emotional health screening.

Results—Delivery rates ranged from 16.7% (flu vaccine) to 50.6% (cholesterol screening). Being female and having a usual source of care significantly increased receipt of services, with females more likely to receive STD screening (p<.001), cholesterol screening (p<.01), emotional health screening (p<.001), diet counseling (p<.01) and exercise counseling (p<.05) than males after controlling for age, race/ethnicity, income, insurance and usual source of care. Young adults with a usual source of care were more likely to receive a flu vaccine (p<.05), STD screening (p<.01), cholesterol screening (p<.001), diet counseling (p<.05) and exercise counseling (p<.05) than those without a usual source of care after adjusting for age, race/ethnicity, income, and insurance.

Conclusions—Rates of preventive service delivery are generally low. Greater efforts are needed to develop guidelines for young adults to increase the delivery of preventive care to this age group, and to address the gender and ethnic/racial disparities in preventive services delivery.

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Keywords

Young adults; preventive services; primary care

Implications and Contribution

This is the first paper to examine young adult-report of preventive service delivery. Our findings suggest that rates of preventive service delivery are generally low, and having a usual source of care facilitates the receipt of a broad range of preventive care.

Introduction

Young adults, spanning the age of 18 to 26, have received little attention in the preventive health literature. This is despite the fact that the transition to young adulthood is accompanied by higher mortality and morbidity rates than in adolescence, much of which is attributed to preventable factors such as binge drinking, substance use, driving under the influence, weapon possession, risky sexual behaviors, and sedentary lifestyle (1-5). Unhealthy behaviors tend to continue into middle and late adulthood, predisposing individuals to preventable chronic conditions such as cardiovascular and respiratory diseases and diabetes.

Interventions that can alter these unhealthy behaviors may have a significant impact on a young person's life, and preventive visits are an optimal time to screen and counsel about health risks (6). Yet, the delivery of preventive services to young adults has not received significant attention in both research literature and clinical practice. Although a broad consensus has emerged for clinical guidelines for adolescent preventive services, there are no specific clinical preventive services guidelines that specifically address the young adult age group (6). Young adults have been the age group most likely to be uninsured in the US (7). This challenge can be potentially mitigated by the Patient Protection and Affordable Care Act of 2010 (ACA), which provides unprecedented expansion of health insurance coverage to young adults up to the 26th birthday, including mandatory coverage for preventive services (8, 9). An important conjecture is whether this increase of access will translate to a corresponding increase in utilization of preventive services.

While multiple studies have examined the receipt of preventive care among adolescents and the general adult population (10-13), only two published studies have focused on young adults' preventive care utilization (14, 15). Both studies utilized provider-reported data from the National Ambulatory Care (NAMCS) and National Hospital Ambulatory Care Surveys (NHAMCS). Findings from these studies indicate that young adults between the ages of 20-29 utilize less ambulatory medical and preventive care than children, adolescents, and older adults (14), and less than one-third (32%) of the visits included some form of preventive counseling. Further, males had fewer visits than females, and Black and Hispanic young adults had fewer visits than other adults (15).

While provider self-report is one important source of information, patient self-report has been shown to be a valuable indicator of utilization and quality of health services both in adult and adolescent literature (16-20). No study has examined the level of preventive care delivery from a young adult-reported perspective. In addition, while previous research has provided information about the influence of demographic characteristics on ambulatory care visits, the influence of demographic variables on the receipt of specific preventive services, such as diet and exercise counseling, are not known. Moreover, while it has been shown that health insurance is a major factor influencing access to health services among young adults

(21), it is not known whether other healthcare access factors, such as having a usual source of care, influence the receipt of specific preventive services among young adults.

This study addressed these gaps in the literature through utilizing a large population health survey, the California Health Interview Survey (CHIS), to examine self-reported rates of preventive service delivery and the relationships between demographic and healthcare access factors on the receipt of preventive services among young adults. Specifically, the goals of this study were to: 1) determine the percent of young adults receiving six different preventive services: flu vaccination, sexually-transmitted disease (STD) screening, emotional health screening, cholesterol screening, diet and exercise counseling; and 2) explore how age, gender, race/ethnicity, household income, insurance status, and presence or absence of usual source of care, are related to the frequency of the receipt of each of the preventive services.

Methods

CHIS design and sampling

We examined data from the 2005 and 2007 CHIS that are available for research purposes in the public use files. While the most recent CHIS data for public use is from 2009, we did not include 2009 data in this analysis because the variables of interest are not available in that year. CHIS, the largest multiethnic, multilinguistic state population health survey in the US, is a random digit dialing survey of the California population that has been conducted every 2 years since 2001. Adults who reside in households are sampled scientifically from every county in the state and interviews are conducted with one randomly selected adult in the household. Data are weighted to compensate for differential probabilities of selection for households to ensure that the sample is representative of the CA population. Detailed description of the sampling methodology can be found in the CHIS 2007 Methodology Series (22). This study was registered with the Committee on Human Research at UCSF under exempt status. All CHIS procedures were approved by the institution review board at UCLA, the State of California, Westat (data collection organization), and the federal Office of the Management of the Budget.

Study participants

Young adults from the age of 18 through 26 years who participated in the CHIS 2005 (n=3670) and CHIS 2007 (n=3621) adult surveys were included in the study. The upper limit of age 26 was used as the ACA extended health insurance coverage to this group effective 2010.

Demographics and health risk profile (Table 1)

Variables in the CHIS dataset that were utilized include: age, gender, race/ethnicity, household income[1], insurance status. Other variables include: whether a young adult had at least 1 sex partner in the past 12 months, and whether he/she reported to be overweight/obese. Young adults reported household income as a percent of FPL. They reported insurance status as currently insured versus not currently insured. CHIS reported participants' overweight/obese status using body mass index (BMI) calculated with self-reported weight and height (kilogram/meter-squared). Using this BMI calculation, young adults were categorized as overweight/obese when BMI is greater than 25 (23).

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[1]Household income was reported as a percent of the federal poverty level, which was $19,350 and $20,650 for a four-person family in 2005 and 2007, respectively.

Healthcare access variable (See Figure 1)

To broadly assess the level of healthcare access, we examined the self-reported rate of the presence or absence of a usual source of care.

Receipt of preventive services variables (See Figure 1)

The survey queried respondents about the receipt of six preventive services. They are receipt of a flu vaccine, STD screening, cholesterol screening, diet counseling and exercise counseling *in the past 12 months*. It asked the receipt of emotional health screening at the *last routine exam*.

Analysis Plan

We performed all statistical analyses using Stata version 11 statistical software package (24). We applied weights provided by the CHIS investigators to generate population frequency estimates of healthcare access and receipt of preventive services. Figure 1 describes the source of each variable. We used a bivariate logistic regression model on each of the preventive service variables by age category, gender, race/ethnicity, income, insurance status, and usual source of care to yield unadjusted odds ratios. We then conducted multivariate logistic regressions for each of the preventive variables with all the demographic and healthcare access variables to yield adjusted odds ratios.

Because the 2005 dataset offered a fuller set of independent variables, we conducted both the bivariate and multivariate analyses only on 2005 data except for the variable emotional health screening, which was only available in the 2007 dataset. As current clinical guidelines recommend that health providers monitor blood cholesterol and provide diet and physical activity counseling to overweight/obese patients (25), we adjusted for overweight/obese status for the variables cholesterol screening, diet counseling and exercise counseling. American Indian/Alaskan Native and Pacific Islanders were excluded in the multivariate logistic regressions due to small sample sizes. Using the method provided by the CHIS investigators, estimates that were considered statistically unstable are noted in Tables 2 and 3.

Results

Descriptive Analysis

Table 1 summarizes the demographic characteristics, health risk profile and healthcare access of our sample. Almost two-thirds of young adults were of the younger age group between the ages of 18-22. There were equal proportions of female and male participants. About two-thirds of the participants were non-White, with about 40% having a household income 200% of FPL. Over 70% of young adults were currently insured.

For healthcare access, the majority of young adults (70%) reported having a usual source of care.

Receipt of preventive services (See Tables 2 and 3)

Less than a quarter of young adults reported receiving a flu vaccine (16.7%), diet counseling (18.1%) or exercise counseling (22.0%) in the past 12 months (Table 2). About half of young adults reported having STD screening (42.2%) and cholesterol screening (50.6%) in the past 12 months. Less than a quarter (21.5%) of young adults reported emotional health screening at the last routine exam (Table 3).

Receipt of preventive services by demographic and healthcare access factors (See Tables 2 and 3)

The unadjusted bivariate analysis results are presented in Tables 2 and 3. The following summarizes results from the multivariate logistic regression model that was adjusted for age category, gender, race/ethnicity, income, insurance status, and usual source of care.

Age

Young adults between the ages of 23-26 were 25% less likely to receive a flu vaccine than young adults between the ages of 18-22 (p<.01). Age was not a factor in the receipt of cholesterol screening, diet counseling, exercise counseling or emotional health screening.

Gender

Females were more likely than males to receive all preventive services except for flu vaccination. Females were 240% more likely to receive STD screening (p<.001); 39% more likely to receive cholesterol screening (p<.01), 49% more likely to receive diet counseling (p<.01), 38% more likely to receive exercise counseling (p<.05), and 74% more likely to receive emotional health screening (p<.001) than males. However, females were 28% less likely to receive a flu vaccine than males (p<.05).

Race/Ethnicity

The receipt of preventive services differed by race/ethnicity in STD screening, cholesterol screening, diet counseling and emotional health screening, but not in flu vaccination and exercise counseling. Black young adults were roughly 100% more likely to receive STD screening than White young adults (p<.01), while Asian young adults were 48% less likely to receive STD screening than White young adults (p<.01). Latino and Black young adults were 87% (p<.001) and 63% (p<.05) more likely to receive cholesterol screening than White young adults, respectively. Latino young adults were almost 100% more likely to receive diet counseling than White young adults (p<.001). Asian young adults were 43% less likely than White young adults to receive emotional health screening (p<.01).

Household income

Young adults with household income of 200-299% FPL were 57% (p<.05) more likely to receive a flu vaccine than those with household income of 0-99% FPL. In contrast, young adults with income of 100-199% FPL were 26% (p<.05) less likely to receive cholesterol screening and 39% (p<.05) less likely to receive exercise counseling than those with household income of 0-99% FPL. Household income was not a factor in the receipt of STD screening, diet counseling and emotional health screening.

Currently insured

Currently insured young adults were 26% more likely to receive cholesterol screening (p<.05), 45% more likely to receive diet counseling (p<.05), and 49% more likely to receive exercise counseling (p<.05) than uninsured young adults. Health insurance status was not a factor in the receipt of a flu vaccine, STD screening and emotional health screening.

Usual source of care

Young adults with a usual source of care were 52% more likely to receive a flu vaccine (p<.05), 54% more likely to receive STD screening (p<.01), 77% more likely to receive cholesterol screening (p<.001), 52% more likely to receive diet counseling (p<.05) and 59% more likely to receive exercise counseling (p<.05) than those without a usual source of care.

Overweight/obese

Young adults who were overweight/obese were 89% (p<.001) and 96% (p<.001) more likely to receive diet and exercise counseling, respectively, than young adults who were not overweight/obese. Being overweight/obese was not associated with the receipt of cholesterol screening.

Discussion

Using a large self-reported population dataset, we found that young adults received low rates of preventive services (16.7-50.6%); however, having a usual source of care led to the receipt of a wider range of preventive services regardless of insurance status. This is consistent with findings from studies in the pediatric and adult population, where the presence of usual source of care plays an important role in improving access to health education and counseling (10-13) (26). Usual source of care is a component of the medical home concept that is widely used to improve quality of care for transition-aged adolescents (27, 28). The results from this study suggest that as uninsured young adults gain access to health insurance through ACA, it will be important to connect them to a regular and known source of care.

Young females were more likely to receive preventive services than young males, except for flu vaccination. The largest disparity between males and females was in STD screening. This likely reflects the female-focused Center for Disease Control and Prevention and U. S. Preventive Services Task Force recommendations on chlamydia and gonorrhea screening guidelines (29-30). It may also be that young males, unlike females, do not have reproductive health needs that prompt them to visit their health providers regularly (31). Our findings support recent work on male adolescent health and suggest that greater effort should also be focused on increasing the use of preventive care among young men (32-33).

Age and household income were not strongly associated with the receipt of preventive services. The age of the young adult mattered only in the receipt of a flu vaccine for which the younger age group was more likely to receive flu vaccine than the older group. Since the younger age group includes young adults of college-age, their higher uptake could be related to the college environment, potentially receiving encouragement via school campaigns, such as posters, advertisements in student newspapers, and college health. It is also possible that a higher percentage of this younger age group continues to seek care at a pediatric medical home where delivery of immunizations is a key scope of practice based on current guidelines (34-35). For household income, young adults with lower income were more likely to receive cholesterol screening, diet counseling and exercise counseling than those with higher income. These findings are similar to those found for nutrition counseling among adolescents (36), suggesting that health providers might perceive low income young adults as having less access to health services, good nutrition and adequate exercise.

This was the first study to examine factors that influence the receipt of three key preventive interventions to improve cardiovascular health in young adults: Cholesterol screening, diet counseling, and exercise counseling. The rate of cholesterol screening was 2-3 times higher than diet counseling and exercise counseling. This likely reflects the practice of universal cholesterol screening in adults above the age of 20 every 5 years according to current guidelines (25, 30), while there is insufficient evidence to recommend for or against routine behavioral counseling to promote a healthy diet or physical activity in primary care settings (30).

We found that racial/ethnic minority young adults were more likely to receive cholesterol screening and diet counseling than Whites, even after adjusting for overweight/obese status.

This is consistent with a previous finding with adolescents, with Blacks and Latinos more likely to receive nutrition counseling than Whites (36). Clinicians may perceive that minority patients are more likely to require screening, either because of perceived elevated risk levels or an assumption of less access to alternative resources for preventive health services (36). Black young adults also reported higher STD screening rates than did White young adults. As the incidence of STD is highest among Black young adults (37), it may be appropriate that Black young adults were more likely than White young adults to report higher rates of screening.

Consistent with findings from a previous study of emotional health screening using CHIS adolescent data (38), we found that female young adults were more likely to report receiving emotional health screening than males. While the prevalence of major depressive disorder in female young adults is twice of male young adults (39), it is unclear whether female young adults are more likely to initiate a discussion about their emotions, or health providers are more likely to screen females for emotional distress.

Limitations

Although CHIS is the largest state population health survey, the data is cross-sectional and limits our ability to establish causality. As CHIS surveys adults who reside in households, this data does not reflect the receipt of preventive services among young adults who live in college dormitories or on military bases. In addition, while patient report has been shown to be a valid indicator of service delivery (16-20), self-report data is an individual's "estimate" of past events, which may be biased by the way an individual recalls events (40). The interpretation of the variable usual source of care is imperfect in that we do not know whether it means a health provider, a health clinic or frequent visits with a particular provider or clinic.

Finally, the emotional health screening variable has a non-specific time-frame as it assessed whether young adults received screening "at the last routine exam".

Conclusions

Young adults have high prevalence of risk behavior, morbidity and mortality, but low utilization of preventive care. Our findings indicate that beyond access to health insurance, having a usual source of care facilitates the receipt of a broad range of preventive care. The ACA enables a greater number of young adults to obtain health insurance and preventive services; however, while multiple professional organizations have established guidelines in many of the preventive areas, there are no uniformly endorsed preventive guidelines to inform the care of this age group (6). Efforts are needed to develop guidelines for young adults to increase the delivery of preventive care to this age group, and to address the gender and ethnic/racial disparities in preventive services delivery.

Acknowledgments

Abbreviations

ACA	Patient Protection and Affordable Care Act of 2010
AMA	American Medical Association
AAP	American Academy of Pediatrics
NAMCS	National Ambulatory Medical Care Survey
NHAMCS	National Hospital Ambulatory Care Survey
STD	sexually-transmitted disease
CHIS	California Health Interview Survey
FPL	Federal poverty level
BMI	Body mass index

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	CHIS 2005	CHIS 2007
Healthcare access 1. *Usual source of care*: "Is there a place that you usually go to when you are sick or need advice about your health?"	X	NA
Preventive Services received in the past 12 months: 1. *Flu vaccination*: "Have you had a flu shot?" 2. *STD screening*: "Have you been tested for STDs?" 3. *Cholesterol screening*§: "About how long ago did you have your blood cholesterol checked?" 4. *Diet counseling*: "Did a health provider give you information about how much or what kind of food you eat?" 5. *Exercise counseling*: "Did a health provider give you information about how much or what kind of exercise you get?"	X X X X X	X X NA NA NA
Preventive Service received at the last routine exam: 1. *Emotional health screening*: "Did you and your doctor talk about your emotions and moods?"	NA	X

*NA means the variable is not available for analysis either due the question not asked in that year's survey or the variable is not in the public use file.

§ The response categories were: "0-12 months," "13 months to 2 years," "25 months to 5 years," "more than 5 years ago," and "never." We recoded these five responses into three categories: "0-12 months," "more than 12 months," and "never."

Figure 1. Descriptions and sources of the healthcare access and preventive services variables
*NA means the variable is not available for analysis either due the question not asked in that year's survey or the variable is not in the public use file.
§ The response categories were: "0-12 months," "13 months to 2 years," "25 months to 5 years," "more than 5 years ago," and "never." We recoded these five responses into three categories: "0-12 months," "more than 12 months," and "never."

Table 1

Descriptive analysis of the demographic characteristics, health risk profile and self-reported healthcare access among young adults in CHIS 2005 and 2007 (percentage rates).

	CHIS 2005 (N=3,670) Population estimates = 4,529,411	CHIS 2007 (N=3,621) Population estimates = 4,679,521
Age		
18-22	57.4%	62.0%
23-26	42.7%	38.0%
Gender		
F	48.3%	48.6%
Race/Ethnicity		
White	33.4%	34.6%
Black	5.8%	5.9%
Latino	45.7%	41.8%
Asian	12.1%	14.8%
Multiracial	2.0%	1.9%
Native/Alaskan American	0.6%	0.5%
Pacific Islander	0.4%	0.5%
Income		
0-99% FPL	20.0%	20.8%
100-199% FPL	22.7%	19.2%
200-299% FPL	15.6%	15.6%
>300% FPL	41.7%	44.4%
Currently insured	70.7%	74.1%
Overweight/Obese	41.8%	40.4%
Have at least 1 sex partner in the past 12 months [*]	73.8%	74.4%
Healthcare access Presence of usual source of care		
Doctor's office/HMO/Kaiser	70.0%	NA
Community/Government/Community	43.3%	NA
Hospital Clinic	26.7%	NA

[*] Source: AskCHIS. An online search tool to obtain health statistics from CHIS.

[§] NA means the variable is not available for analysis either due the question not asked in that year's survey or the variable is not in the public use file.

[†] Defined as body mass index >25 based on self-reported weight and height.

Table 2

Receipt of flu vaccination, STD screening in the past 12 months and emotional health screening at the last routine exam (percentage rates, odds ratios, adjusted odds ratios, 95% confidence intervals).

	Flu vaccination (2005) N= 3670 Pop est. = 4,529,411	STD screening (2005) N=2827 Pop est. =3,329,306	Emotional health screening (2007) N=3229 Pop est. = 4,143,427
Overall	16.7%	42.2%	21.5%
Age			
18-22 (reference)	18.6%	44.6%	20.2%
23-26	14.3%	39.7%	23.6%
OR	**0.73 (0.59-0.90)** [†]	**0.82 (0.68-0.99)** [‡]	1.22 (0.95-1.58)
[a]OR	**0.75 (0.61-0.92)** [a][†]	0.85 (0.69-1.06) [a]	1.22 (0.93-1.59)[g]
Gender			
M (reference)	18.2%	27.0%	16.5%
F	15.3%	57.5%	26.2%
OR	0.81 (0.62-1.06)	**3.66 (2.95-4.53)** [§]	**1.80 (1.39-2.32)** [†]
[a]OR	**0.72 (0.55-0.95)** [b][‡]	**3.40 (2.70-4.28)** [b§]	**1.74 (1.33-2.27)**[h][§]
Race/Ethnicity			
White (reference)	17.1%	44.3%	22.9%
Latino	16.3%	40.4%	21.9%
OR	0.94 (0.73-1.21)	0.85 (0.69-1.06)	.94 (0.69-1.28)
[a]OR	1.23 (0.84-1.51) [c]	1.04 (0.81-1.34) [c]	0.96 (0.66-1.39)[i]
Black	18.4%	59.9%	22.8%
OR	1.09 (0.67-1.78)	**1.88 (1.19-2.98)** [†]	0.99 (0.57-1.74)
[a]OR	1.18 (0.70-1.97) [c]	**2.08 (1.24-3.48)** [c][†]	0.97 (0.53-1.76) i
Asian	18.3%	28.2%	14.2%
OR	1.07 (0.74-1.55)	**0.50 (0.33-0.76)** [†]	**0.62 (0.42-0.92)** [‡]
[a]OR	1.08 (0.74-1.57) [c]	**0.52 (0.34-0.80)** [c][†]	**0.57 (0.37-0.84)** [i][†]
Multiracial	14.1%	53.8%	32.9%
OR	0.79 (0.43-1.46)	1.46 (0.86-2.49)	1.65 (0.86-3.15)
[a]OR	0.85 (0.45-1.60) [c]	1.59 (0.94-2.72) [c]	1.65 (0.86-3.19) [i]
Income			
0-99% FPL (reference)	12.7%	41.4%	20.8%
100-199% FPL	16.5%	40.5%	23.1%
OR	1.36 (0.91-2.03)	0.96 (0.71-1.31)	1.15 (0.78-1.68)
[a]OR	1.37 (0.92-2.05) [d]	1.06 (0.75-1.49) [d]	1.20 (0.81-1.79)[j]
200-299% FPL	19.6%	39.0%	23.6%
OR	**1.68 (1.21-2.33)** [†]	0.90 (0.63-1.29)	1.18 (0.72-1.93)
[a]OR	**1.57 (1.11-2.21)** [d‡]	0.97 (0.65-1.44) [d]	1.21 (0.72-2.02) [j]
>300% FPL	17.8%	44.6%	20.4%
OR	**1.49 (1.11-2.01)** [†]	1.14 (0.85-1.53)	0.97 (0.65-1.46)
[a]OR	1.36 (0.97-1.91) [d]	1.27 (0.89-1.82) [d]	1.05 (0.65-1.68) [j]
Currently insured			
No (reference)	12.7%	31.7%	17.0%
Yes	18.5%	46.3%	22.8%
OR	**1.56 (1.16-2.10)** [†]	**1.86 (1.48-2.34)** [§]	**1.44 (1.02-2.02)** [‡]
[a]OR	1.33 (0.98-1.83) [e]	1.29 (0.97-1.72) [e]	1.39 (0.96-2.03)[k]
Usual source of care			
No (reference)	12.4%	30.1%	NA
Yes	18.7%	46.9%	NA
OR	**1.63 (1.18-2.24)** [†]	**2.05 (1.62-2.58)** [§]	NA
[a]OR	**1.52 (1.09-2.12)** [f‡]	**1.54 (1.19-2.01)** [f][†]	NA

[§]P< 0.001

[†]P< 0.01

[‡]P< 0.05

*||*Statistically unstable

*a*Adjusted for gender, race/ethnicity, income, insurance status, usual source of care

*b*Adjusted for age, race/ethnicity, income, insurance status, usual source of care

*c*Adjusted for age, gender, income, insurance status, usual source of care

*d*Adjusted for age, gender, race/ethnicity, insurance status, usual source of care

*e*Adjusted for age, gender, race/ethnicity, income, usual source of care

*f*Adjusted for age, gender, race/ethnicity, income, insurance status

*g*Adjusted for gender, race/ethnicity, income, insurance status

*h*Adjusted for age, race/ethnicity, income, insurance status

*i*Adjusted for age, gender, income, insurance status

*j*Adjusted for age, gender, race/ethnicity, income

*k*Adjusted for age, gender, race/ethnicity, insurance status

Table 3

Receipt of cholesterol screening, diet and exercise counseling in the past 12 months (percentage rates, odds ratios, adjusted odds ratios, 95% confidence intervals).

	Cholesterol screening (2005) N=3670 Pop est.= 4,529,411	Diet counseling (2005) N=2955 Pop est. = 3,557,718	Exercise counseling (2005) N=2955 Pop est.= 3,557,718
Overall	50.6%	18.1%	22.0%
Age			
18-22 (reference)	50.3%	17.1%	20.1%
23-26	51.1%	19.4%	24.6%
OR	1.03 (0.88-1.21)	1.16 (0.89-1.52)	1.29 (1.00-1.67)
[a]OR	1.02 (0.86-1.21) [a]	1.08 (0.80-1.44)[a]	1.22 (0.92-1.61)[a]
Gender			
Male (reference)	45.8%	15.0%	19.1%
Female	55.8%	20.7%	24.5%
OR	**1.50 (1.25-2.26)** [§]	**1.49 (1.17-1.89)** [†]	**1.37 (1.09-1.74)** [†]
[a]OR	**1.39 (1.15-1.68)** [b †]	**1.49 (1.15-1.94)**[b †]	**1.38 (1.06-1.80)** [b‡]
Race/Ethnicity			
White (reference)	44.6%	12.3%	19.6%
Latino	55.6%	22.0%	22.6%
OR	**1.57 (1.30-1.91)** [§]	**2.01 (1.55-2.62)** [§]	1.20 (0.91-1.58)
[∥]OR	**1.87 (1.48-2.36)**[c§]	**1.91 (1.43-2.57)** [c §]	1.23 (0.91-1.67) [c]
Black	56.5%	17.6%	23.7%
OR	**1.62 (1.10-2.38)** [‡]	1.52 (0.89-2.61)	1.28 (0.72-2.26)
[a]OR	**1.63 (1.08-2.45)** [c ‡]	1.23 (0.71-2.13) [c]	1.10 (0.63-1.95) [c]
Asian	43.4%	20.5%	25.1%
OR	0.96 (0.73-1.27)	**1.94 (1.18-2.95)** [∥]	1.38 (0.87-2.17)
[a]OR	1.06 (0.76-1.43) [c]	**1.95 (1.25-3.05)** [c ∥]	1.54 (0.97-2.43) [c]
Multiracial	50.4%	16.3%	23.7%
OR	1.27 (0.83-1.93)	1.38 (0.73-2.63)	1.27 (0.72-2.27)
[a]OR	1.35 (0.90-2.03) [c]	1.26 (0.67-2.38) [c]	1.25 (0.72-2.18) [c]
Income			
0-99% FPL (reference)	55.4%	23.0%	25.9%
100-199% FPL	46.8%	17.2%	17.3%
OR	**0.71 (0.55-0.92)** [‡]	**0.69 (0.48-1.00)** [‡]	**0.60 (0.40-0.88)** [‡]
[a]OR	**0.74 (0.57-0.96)**[d ‡]	0.74 (0.51-1.07) [d]	**0.61 (0.41-0.92)** [d‡]
200-299% FPL	48.9%	22.7%	23.7%
OR	0.77 (0.59-1.01)	0.98 (0.69-1.40)	0.89 (0.61-1.30)
[a]OR	0.84 (0.63-1.11) [d]	1.12 (0.78-1.61) [d]	0.92 (0.63-1.35) [d]
>300% FPL	51.0%	14.5%	21.9%
OR	0.84 (0.66-1.07)	**0.57 (0.41-0.78)** [†]	0.80 (0.60-1.07)
[a]OR	0.99 (0.76-1.29) [d]	0.69 (0.48-1.00) [d]	0.84 (0.61-1.16) [d]
Currently insured			
No (reference)	46.7%	14.5%	16.0%
Yes	53.4%	19.2%	23.9%
OR	**1.45 (1.22-1.74)** [§]	**1.41 (1.02-1.94)** [‡]	**1.65 (1.16-2.35)** [†]
[a]OR	**1.26 (1.03-1.54)**[e ‡]	**1.45 (1.04-2.02)** [e‡]	**1.49 (1.02-2.17)** [e ‡]
Usual source of care			
No (reference)	39.9%	13.5%	15.2%
Yes	55.2%	19.4%	24.0%
OR	**1.86 (1.53-2.26)** [§]	**1.54 (1.10-2.15)** [‡]	**1.77 (1.22-2.57)** [†]
[a]OR	**1.77 (1.41-2.21)**[f§]	**1.52 (1.08-2.13)** [f ‡]	**1.59 (1.07-2.38)** [f ‡]
Overweight/obese			
No (reference)	48.6%	14.5%	17.7%
Yes	53.4%	23.1%	28.2%
OR	**1.21 (1.01-1.45)** [‡]	**1.77 (1.37-2.28)** [§]	**1.83 (1.46-2.29)** [§]
[a]OR	**1.20 (1.00-1.45)**[g]	**1.89 (1.44-2.49)** [g §]	**1.96 (1.53-2.51)** [g§]

[§]P< 0.001

[†]P< 0.01

[‡]P< 0.05

[∥]Statistically unstable

[a]Adjusted for gender, race/ethnicity, income, insurance status, usual source of care, overweight/obese

[b]Adjusted for age, race/ethnicity, income, insurance status, usual source of care, overweight/obese

[c]Adjusted for age, gender, income, insurance status, usual source of care, overweight/obese

[d]Adjusted for age, gender, race/ethnicity, insurance status, usual source of care, overweight/obese

[e]Adjusted for age, gender, race/ethnicity, income, usual source of care, overweight/obese

[f]Adjusted for age, gender, race/ethnicity, income, insurance status, overweight/obese

[g]Adjusted for age, gender, race/ethnicity, income, insurance status, usual source of care